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GENERAL CONTINGENCY THEORY OF ORGANIZATIONS: AN ALTERNATIVE TO OPEN SYSTEMS THEORY

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General contingency theory (GCT) is offered as an alternative to open systems theory (OST) as the foundation for improved organizational performance. It is argued that GCT can provide more precise conceptual variables and an integrative framework for relating environmental and organizational variables in order to provide functional predictions.

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Open systems theory (OST) first recognized the environment as an important variable in the study and understanding of formal organizations. Widely popularized in the 1960's, systems theory emphasized the interrelatedness and interdependence of the parts to the whole. Few students of organizations would argue that in the past fifteen years, systems theory has emerged as the most efficacious paradigm for investigating relationships between the various parts of organizations and, when its openness is stressed, in studying environmental interfaces. Yet, in spite of its usefulness as a general theory of organizations, open systems theory lacks the precision necessary to lead to increased effectiveness. For example, Kast and Rosenzweig (1974) question whether managers are sophisticated enough to use the systems paradigm to better organizational performance.

We feel that an alternative theory that is able to translate the important elements of OST into more operational terms in order to increase organizational effectiveness is needed. More specifically, human organizations as open social systems require the management of human resources to be effective. Yet, open systems theory is not able to offer anything operational—only general considerations derived from genetic and mechanical open systems. We have recently proposed a general contingency theory (GCT) of management (Luthans and Stewart, 1977) which promises to accomplish the operationalization of OST for improved organizational effectiveness. Derived from open systems theory, GCT utilizes more concrete operational variables such as management, resources and environment and results in a highly pragmatic scheme for practicing managers to in-

crease their effectiveness in modern organizations.

The purpose of this paper is to operationalize open systems theory for human organizations [level eight in Boulding's (1956) scheme of open systems analysis]. Specifically, open systems theory and general contingency theory will be separately analyzed and then it will be demonstrated how general contingency theory (GCT) can better contribute to organizational effectiveness.

An Analysis of Open Systems Theory

Ludwig von Bertalanffy (1950) is widely recognized as the first to construct a theory of all systems approaches in general and called it general systems theory (GST). Later Kenneth Boulding (1956) categorized all systems into a single framework by constructing a nine-level hierarchy of systems ranging from static structure frameworks to transendental systems. Briefly summarized these are:

1. The first level can be called the level of frameworks. This represents static structures such as the anatomy of the universe.

2. The next level was referred to as the level of clockworks. Simple dynamic systems consisting of predetermined necessary motions exist in this level.

3. The third level is the level of the thermostat. This level consists of self-regulation and maintaining equilibrium--cybernetic characteristics.

4. The first level of the open system and self-maintaining structure, which can be called the level of the cell.

5. The genetic-societal level is next, typified by plants. This level is studied by the botanist.

6. The level of animals follows, characterized by increased mobility, teleological behavior and self-awareness.

7. The seventh level is that of the human. The individual human being is considered as a system with self-awareness and the ability to utilize language and symbolism.

8. Social systems constitute the eighth level. Attention at this level is directed toward the content and meaning of messages, the nature and dimension of value systems, the transcription of

images into historical records, and the complex gamut of human emotion.

9. Transendental systems represent the final level of the structure. These are the ultimates, absolutes and the inescapables, unknowables, which exhibit systematic structure and relationship.

Levels one to three emphasize physical or mechanical systems and are closed systems. Levels four to six--biological systems--and levels seven through nine--human and social systems--are all recognized as open systems.

In contrasting social systems with lower order physical systems, Katz and Kahn (1966) stress system's elaboration and importation of energy. Rather than becoming less differentiated as physical systems do, social systems tend to become more elaborated, due to the ability to import energy from the world around it. A more careful examination of open systems characteristics is helpful in better understanding human organizations as open social systems.

Open Systems Characteristics

Systems are either closed or open. The closed system perspective of organizations emphasizes internal structure, tasks and formal relationships. In contrast, open systems are characterized by their openness--interchanges with the environment which are vital to the organization. These interchanges are the dynamic relationships of open systems with their environment and are typically characterized by the various input, transformation processes and outputs. The net result of the system-environment interchange (importation of matter, energy, and information) results in offsetting the entropic process of running down, thus achieving static equilibrium (Katz and Kahn, 1966).

Katz and Kahn (1966) describe the characteristics of open systems with these nine attributes:

1. Importation of energy: All open systems import some form of energy from the external environment.

2. Through-put: Energy imported into the system is transformed in some manner. Work is done in transforming energic input either into maintenance outcomes or output products.

3. Output: The result of the transformation process is some product being output to the external environment.

4. Systems as cycles of events: Open systems import energy, process it through transformations, output a product and receive more energy in exchange. Thus the whole cycle begins all over again.

5. Negative entropy: Systems survive by importing energy that arrests the entropic process. Rather than consuming all of its resources and running down to a static equilibrium, open systems import more energy from their environment than they expend, store energy and thus acquire negative entropy.

6. Information input, negative feedback and the coding process: Inputs are not only material for the purpose of transformation, but information also for the purpose of system's control and goal seeking. Monitoring outputs and feeding back information to the system is the basis of this control. The coding process acts as a filtering mechanism, rejecting some inputs, and accepting and translating others into acceptable states for the system.

7. The steady state and dynamic homeostasis: The open system continually strives for a dynamic equilibrium among parts and the environment. The equilibrium is not static; rather a continuous series of energy exchanges and relations between parts. When changes occur due to external forces upon the system, adjustments are made which include the possible inclusion of the disturbance from the environment into the system.

8. Differentiation: Rather than maintaining a constant set of relationships, open systems move in the direction of increased differentiation and elaboration.

9. Equifinality: Open systems can begin with different initial starting conditions and arrive at the same end point. Or they can begin with the same initial conditions and arrive at different end points.

From the above list of open system's characteristics, the two central themes of open systems theory can be seen: (1) exchanges with the environment and (2) interrelationships. Exchanges with the environment incorporate the concepts of negative entropy, inputs, transformations and output, and cycles of events. Interrelationships involve transformations, differentiation, equifinality and dynamic homeostasis, i.e. the internal adjustments and processes of the system.

Because the human organization is composed of human elements or objects we would maintain that the open systems view has only limited applicability for social systems. Hence, even though all open systems may display the previous

characteristics as indicated by Katz and Kahn (1966), open social systems have some additional characteristics not displayed by the purely genetic or mechanical systems in levels one through seven of Boulding's framework.

Human Organizations as Open Systems

By viewing human organizations as open systems, the enormous amount of complexity to be managed becomes clearer while at the same time a method is provided for containing and understanding the complexities. However, in order to adequately understand human organizations as open systems, some additional characteristics of social systems need to be identified.

Katz and Kahn (1966) point out that unlike other genetic open systems, human organizations are composed of elements which pass in and out of the system. When these "carriers" of the system are ignored, a vital aspect of human organizations is missed. Instead of the objects (humans) remaining in the system and constituting a structure of objects in physical relationship to each other, human organizations as open systems are bonded together psychologically. Kast and Rosenzweig (1974) interpret the psychological relationships as structures of events.

Katz and Kahn (1966) go on to suggest two main problems in understanding human organizations as open social systems. The first problem consists of identifying systems boundaries. Physical systems have obvious physical boundaries, yet human organizations do not. Second, is the problem of equating organizational members' goals to the system's goals. Lower order open systems (e.g. physical or biological) display neither of these attributes of open social systems.

In further cautioning against making exact analogies between human organizations and physical or biological systems, Kast and Rosenzweig (1974) consider the organization as not simply a technical or social system. Rather it is the structuring and integrating of human activities around various technol-

ogies that makes it unique from other types of open systems. They go on further to view the organization as an open, sociotechnical system, composed of five subsystems: goals and values, psychosocial, structural, technical and managerial.

Although all open systems display the characteristics of interrelatedness and exchanges with their environments, only social open systems display in addition the characteristics of structure of events which consequently requires a management subsystem. Katz and Kahn (1966) claim this uniqueness is due to the "contrived" nature of human organizations. Later in this paper it will be seen that the managerial component must be considered a critical component of the open social system.

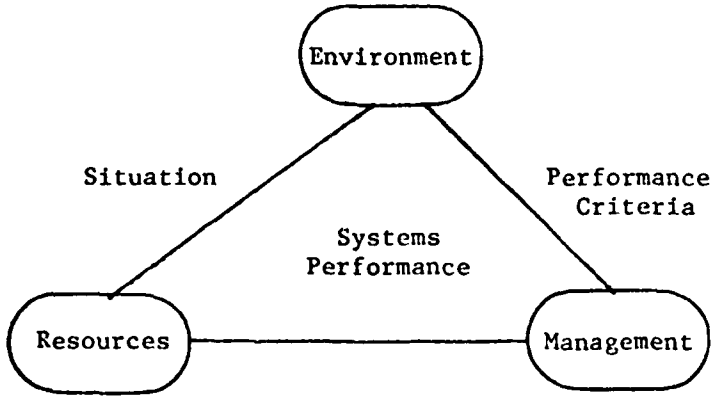
An Analysis of General Contingency Theory

GCT was developed in response to the need for an integrative theory of management that incorporates the *environment* (in the open systems sense) and begins to bridge the theory-practice gap for improved organizational effectiveness (see Luthans and Stewart, 1977 for a complete discussion of GCT). This approach views the organization as essentially a social system, whose subsystems interact with the external environment to achieve a set of goals or objectives. Three sets of systems variables are advocated and combined into a hierarchy of primary, secondary and tertiary levels. The variables are:

Primary level:	environmental suprasystem (beyond direct control of the manager)	(E)
	resource subsystem (under direct control of the manager)	(R)
	management subsystem (concepts and techniques of management practice)	(M)

Secondary level:	situation	E x R
	organization	M x R
	performance criteria	M x E
Tertiary level:	systems performance	M x R x E

A summary of the variables and relationships in the contingency model of the organization is shown in the following figure (Luthans and Stewart, 1977).



Organization

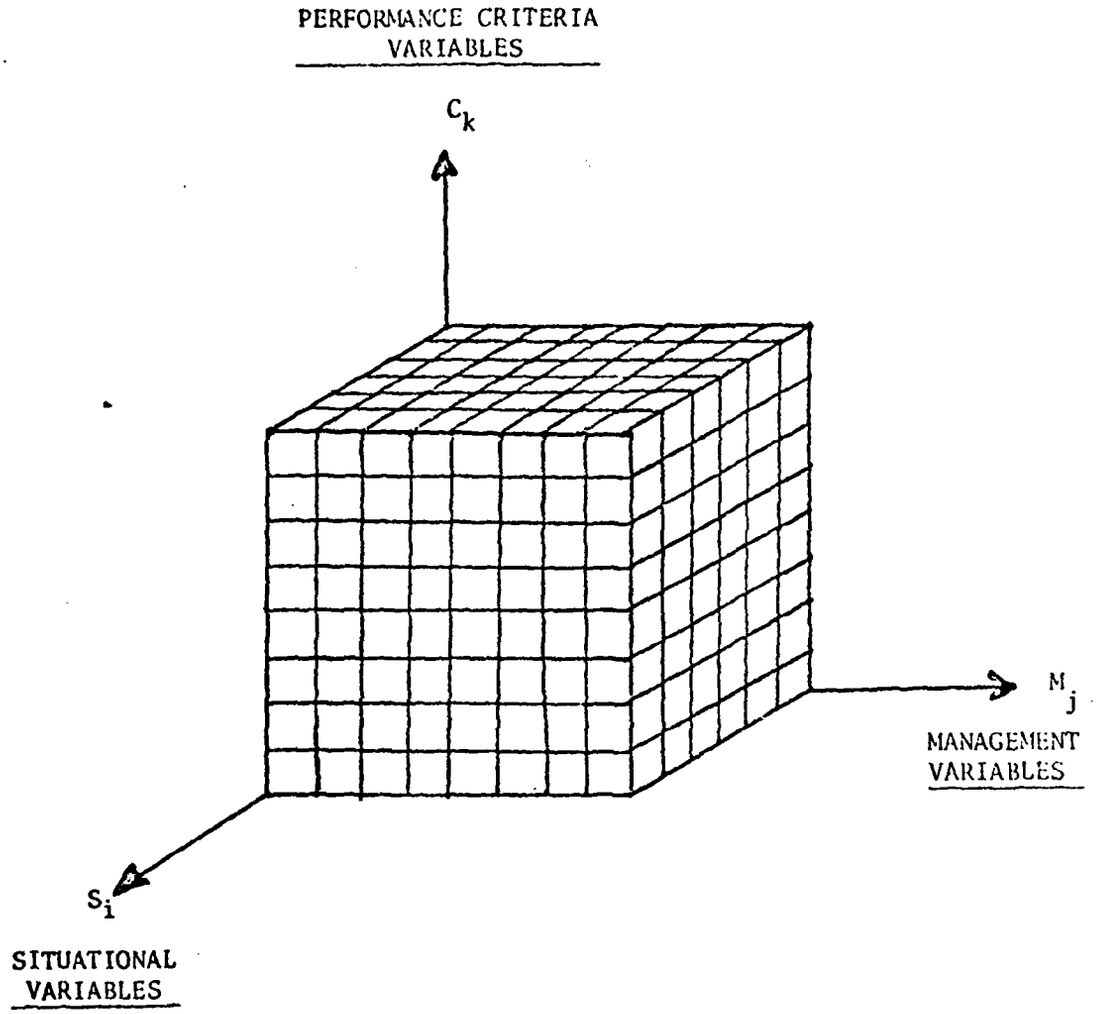
Through a series of logically related steps, the GCT approach results in a set of general functional relationships which relate systems performance as functionally determined by the interaction of independent situational, management and performance criteria variables. An overall dipiction of systems performance is indicated by the following expression:

$$P = f(S \times M \times PC)$$

The general form of the systems performance expression forms the basis for the general contingency matrix shown in the figure that follows. The three variables S (situation), M (management) and PC (performance criteria) form three axes which can use nominal scales for measurement. Systems per-

[Insert GCT Matrix about here]

formance (P) results from the intersection of the S, M and PC variables and represents the outcome variable. The matrix framework functionally relates independent situational variables to management concepts to performance cri-



(Source; Luthans and Stewart, 1977)

teria that results in system performance.

For the practitioner, the GCT matrix allows him/her to operationalize the systems variables for effective performance. The matrix contains a database from which systematic strategy for determining the appropriate intervention strategy in an organization. This strategy would center around a contingency audit, which allows the manager to undertake organizational change or development (diagnosis) interventions for improved effectiveness. In application, if any two of the variables are known, the matrix can provide the third. For example, if management can diagnose the situation and apply a particular technique, the matrix can reveal how effective it will be. However, this predictive capability, of course, is only as good as the database contained in the matrix. The database must contain empirically verifiable functional relationships to prove useful for the practice of management. At present, the cells in the matrix are largely incomplete or void. But the GCT matrix still provides a conceptual framework for existing management knowledge and can serve as a useful guide for future research.

Relating OST to GCT

In this last section we will attempt to explain OST in terms of the GCT variables and compare and contrast OST with GCT. Although open systems theory describes system's behavior and is supposedly a framework for all living systems, it does not offer any specific conceptual variables nor does it define the relationships among concepts that would lead to improved organizational effectiveness. Furthermore, OST only leads to improved understanding; it is not performance oriented. We propose to show how GCT can provide both an understanding of human organizations as well as a way to implement and use the concepts of open systems theory for improved organizational effectiveness.

Re-interpreting OST Characteristics

Typically, discussions of OST will provide a list of attributes which include energy importation, negative entropy and system's boundaries. The partial failure of OST to go beyond mere description of systems has been the lack of more operational conceptual variables. We maintain that the variables of GCT can be used to overcome this problem.

Table 1 shows a comprehensive summary of the relationships between open systems theory and general contingency theory. Taking the first characteristic of OST, energy importation, is made more operational by the interpretation of energy as resources acquired by the organization from the external environment. Human resources for labor replenishment due to turnover and non-human resources such as raw materials and money are examples. The second item of output from an organization is the result of system's performance, subject to particular criteria. GCT defines output as environmental requirements being satisfied under the mediation and control of management. The third characteristic of open systems throughput involves acquiring inputs from the environment and processing them into some other form. In human organizations, Thompson (1967) noted that processing inputs requires a certain amount of technology and relative certainty. Management and resources interact to establish, control, coordinate, and carry out certain processes in order to accomplish the system's throughput. The fourth item of open systems cycles of events is depicted as inputs are processed into outputs, followed by exchanges of outputs for new energic inputs such as money. Then the cycle repeats all over again. GCT best represents this cyclic nature of the organization by the systems performance equation. The situation (E x R-- resources interacting with the environment) and the performance criteria (PC) are mediated by management processes (M) which then result in systems performance (SP) and are manifested as outputs such as products and services.

TABLE I: THE RELATIONSHIP BETWEEN OPEN SYSTEMS THEORY AND GENERAL CONTINGENCY THEORY

OPEN SYSTEMS THEORY	GENERAL CONTINGENCY THEORY	COMMENTS
1. ENERGY IMPORTATION	SITUATION (S) = E x R	RESOURCES FROM ENVIRONMENT -- HUMAN RESOURCES (LABOR TURNOVER) AND NON-HUMAN RESOURCES (RAW MATERIALS).
2. OUTPUT	PERFORMANCE CRITERIA PC = M x E	MANAGEMENT INTERATION WITH ENVIRONMENT FOR DISPOSAL OF SERVICES OR PRODUCTS INTO ENVIRONMENT.
3. THROUGHPUT	ORGANIZATION PROCESSES M x R	INVOLVES PROCESSING INPUTS
4. CYCLES OF EVENTS	$SP = S \overset{E \times R}{\times} PC$ (M)	IMPORTATION OF RESOURCES (S) REQUIRED FOR THROUPUT PERFORMANCE (PC) CONTROLLED BY MANAGEMENT. OUTPUT (SP) IS INTO ENVIRONMENT WHERE OUTPUT EXCHANGED FOR RESOURCES (R) IN SITUATION, THUS BEGINNING ALL OVER AGAIN.
5. NEGATIVE ENTROPY	S = E x R ORG = M x R	IMPORTATION OF ENERGY PREVENTS ORGANIZATION FROM RUNNING DOWN. E x R IS NEW RAW MATERIALS AND HUMAN LABOR; M x R IS MOTIVATION, INCENTIVES.
6. INFORMATION INPUT, NEGATIVE FEEDBACK, CODING PROCESS	$PC = \overset{M}{E}$ $ORG = \overset{M}{R} \times E$	INFORMATION INPUT AND NEGATIVE FEEDBACK ARE ENVIRONMENTAL INPUTS (E) FOR MANAGEMENT COMPARISON TO PERFORMANCE CRITERIA. MANAGEMENT (M) MEDIATES RESOURCE (R) INPUTS FROM ENVIRONMENT (E) BY A CODING OR FILTERING PROCESS.
7. STEADY STATE AND DYNAMIC HOMEOSTASIS	PC = M x E S = E x R	MANAGEMENT (M) MEDIATES ENVIRONMENTAL INFLUENCE (E) IN DISRUPTING ORGANIZATION. RESULT (PC) MAY BE NEW MANAGEMENT, ADDITIONAL FUNCTIONAL AREAS OR ACQUISITION OF ENVIRONMENTAL OBJECT (ACQUIRING SUBSIDIARY).
8. DIFFERENTIATION	ORG = M x R	INTERNAL CHANGES AND ADJUSTMENTS WITHIN ORGANIZATION. MANAGEMENT FUNCTIONS (M) CHANGE OR RESTRUCTURING RESOURCES (R) (DEPARTMENTATION OR SPECIALIZATION)
9. EQUIFINALITY	SP = S x M x PC	SAME ORGANIZATIONAL OUTCOMES (SP) CAN RESULT FROM DIFFERENT STARTING CONDITIONS. PROFIT OUTCOME CAN RESULT FROM DIFFERENT MANAGEMENT STYLES, SITUATIONS OR PERFORMANCE CRITERIA (PC).
10. BOUNDARIES	M x R	SOCIAL SYSTEMS HAVE NO STRUCTURE OF PHYSICAL SPACE; INSTEAD A STRUCTURE OF EVENTS AND FUNCTIONS. NO PHYSICAL BOUNDARIES AS WITH CELL, PLANT OR ANIMAL. BOUNDARIES NOT EFFECTIVE CONCEPT.
11. HOLISM	SP = S x M x PC	HUMAN ORGANIZATION COMPOSED OF MANY SUBSYSTEMS. OUTPUTS (SP) FROM ONE SUBSYSTEM ACT AS INPUTS (R) TO ANOTHER SUBSYSTEM. REQUIRES MANAGEMENT CONTROL OF SITUATION (S) AND SYSTEM'S MANAGEMENT OF SUBSYSTEM PERFORMANCE CRITERIA (PC).

The fifth characteristic of negative entropy is the opposite of the entropic process, where the system runs down, loses its differentiated structure, and becomes one with the environment. In GCT the situation, represented by E x R, indicates the importation of energy from the environment. Typical of this energy would be the elements received in exchange for system's outputs such as money to acquire new system's inputs. Open systems are able to grow and differentiate, primarily due to importation of energy and the ability to store more energy than they use. A form of energy input unique to human organizations is the "revitalizing" of the human element in the social system. This "revitalization" takes the form of motivations and incentives, rewards, and promises for the future.

The next grouping of information input, negative feedback and coding processes centers around information and energy inputs. Information input and negative feedback are both information forms and input. The former is based on surveilance gathering about the environment and the later based on monitoring the system's performance. Both are information energy received from the environment and hence are represented in GCT by environment (E) leading to performance criteria (PC) mediated by management functions (M). The performance criteria (PC) is established by management (M), but requires information on actual performance. The coding process represents selection of resource inputs (R) from the environment (E) via a coding mechanism which rejects or accepts and translates these inputs for the organizational structure. Coding is mediated by management since it is directly involved in setting performance criteria. Systems coding is also the barriers established by the organization to control what resources and systems elements (e.g. human resources) enter into the organizational activities (i.e. permeate the boundaries of the system).

The steady state characteristic requires negative feedback in order to

compare system's performance with desired goals. Homeostasis represents a state of dynamic equilibrium where inputs equal outputs. However, living systems grow and differentiate when counteracting entropy, resulting from coping with external forces by acquiring control over them. Thus, by incorporating the external forces into the system's activities, the system brings these forces inside the system's boundaries. GCT represents steady state by management interaction with the environment and monitoring of systems performance criteria. Dynamic homeostasis is a situation involving the resources of the organization (R) in response to the environment (E).

The differentiation characteristic of organizations results from growth and elaboration when dynamic homeostasis is working. Due to the system growth and expansion through acquiring more complex and comprehensive equilibriums in homeostasis, the system becomes more specialized such as in areas of labor, management techniques and technology. Differentiation is manifest across the internal dimensions of the organization, thus necessitating an understanding of management interacting with the system's resources (M x R).

The nineth characteristic of equifinality centers around the concept of achieving systems performance when beginning with different initial starting conditions. GCT represents equifinality with the variables of situation (E x R), management (M), and performance criteria (PC). Human organizations can begin with different situations or operate with different management control and planning methods while at the same time utilizing different sets of performance criteria, all for the same outcome. Profit would be an example. Equifinality is a core concept of the contingency approach through its insistence on non-universal methods to obtain organizational outcomes.

The tenth item of system's boundaries are readily identifiable in living systems below social systems. However, since human organizations are structured through events rather than special relationships, the organization is defined by

these events that take place according to predetermined performance criteria. Boundaries for a human organization are not tangible, hence not identifiable. GCT operationalizes the boundary concept by default, i.e., the events are represented by management interacting with system resources (M x R).

The last open system's concept to be interpreted in terms of GCT variables is holism. Essentially, holism represents the interrelatedness and interdependencies of all the subsystems with each other. Outputs from one subsystem serve as energic inputs to another subsystem. GCT utilizes the system performance equation for each subsystem to represent outputs from one subsystem (SP) are inputs to the other subsystem, represented by the situation (E x R) of energic resources input from the environment. The environment of one subsystem is all the other subsystems within the entire organization. The final system's outcome or output of services or products depends upon the synergistic functioning of all the subsystem relationships of inputs and outputs.

Although OST must be general in order to describe a wide range of systems phenomena, it can be seen that GCT is able to provide a more operational resolution to the meaning of OST characteristics for organizational analysis. More specifically, GCT can help make OST more operational for organizational effectiveness. Through the use of three primary variables--M, R and E--the various characteristics of OST can be made more understandable and applicable.

Bridging the Theory--Practice Gap

In order to better understand how GCT can be a viable alternative to OST, a comparison between theory and practice for the two theoretical frameworks can be made. The criteria for comparison on a theory basis will be definition of variables, and explication of relationships. Additionally, the potential the GCT has for understanding, prediction and control will be examined. It is our contention that GCT can serve as an invaluable framework in guiding and clarify-

ing relationships among situation, management and desired performance outcomes. We will show that the GCT matrix can lead to organizational effectiveness.

The Theory as a Basis for More Effective Practice

As Schoderbek (1975) and others have noted, OST as a theory lacks any definitive doctrine or body of knowledge for the more effective practice of management. Certainly, as we have shown, the attributes and characteristics of OST can be defined (e.g. Katz and Kahn, 1966). However, without an explicit statement of what the variables are and the relationships between them, one could question whether a theory really exists (Dubin, 1969). Phillips (1975) accused systems theory of not precisely specifying what constitutes a system. Definitions of systems that range from extremely vague, obtuse and tautological obviacacies to simple nonsensical statements can be found in the literature. Although few would argue that open systems theory does increase the understanding of the workings of complex organizations, we would maintain that it only explains after the fact what has happened. As Schoderbek (1975) points out, any predictions from OST made before the facts are too vague to be refuted. GCT, on the other hand, posits specific variables and relationships from which propositions can be derived. Employing the three primary variables of E, M and R, secondary variable relationships and propositions such as the following can be derived:

Secondary GCT Variables	Propositional Forms
Situation = E x R:	$E \xrightarrow{M} R$
Organization = M x R:	$M \xrightarrow{E} R$

Performance Criterion = M x E: $M \xrightarrow{R} E$

$E \xrightarrow{R} M$

Systems Performance: $P = S \times M \times PC$ where S = situation (E x R)
M = management
PC = perf. crit (M x E)

$PC \xrightarrow{M/S} P$

ExR

In particular, derived from the above, it can be said that:

1. Situations. The situation can be viewed as the environment interacting with the resources necessary in order for the organization to function effectively. The function of management is to mediate the environmental impact upon the organization through the coding process. An example is the personnel function of selecting, evaluating and hiring new labor (human resources). Since management is constantly in tune with the environment (i.e. determining the performance criteria) it has the information (from feedback and new information inputs) on what is required by the environment. Hence, the necessary resources to accomplish the desired tasks are determined.

2. Organizations. The organization itself is an interaction between management and its resources. Structure, differentiation, specialization and hierarchy of authority as well as technology for the purpose of planning and control are the result of management and human resources. Due to the mediating influences the environment has upon the tasks at hand, management determines how the resources will be organized, acquired, utilized and allocated. More emphasis is placed upon management as an indepent variable than resources, since management is the variable that interacts in an "intelligent" manner with the environment. This can also be seen in the sys-

tems performance statement of interaction where effective performance is subject to management practice.

3. Performance criteria. Propositions concerning performance criteria are seen as management interpreting the environment and mediated by the available resources. For example, management may interpret the legal environment as satisfactory rather than maximum profits. In addition, the available resources (e.g. money, documentation on past experience, skills available in the organization)-mediate and affect how much this environmental force will determine management's adoption and/or change. On the other hand, management can also influence the environment, subject to the available resources such as money, skills of human resources, and available technology. Examples of this would be the influence a large industry has through its lobbying efforts on political and legislative bodies or labor unions who are very influential in changing their external environment. Both, however, are subject to their money resources and available human skills (lawyers, mass media and lobbying skills).

4. Systems performance. This is determined by performance criteria (subgoals) within the organization. This relationship is mediated by management technologies and practices along with the situation facing the organization. The systems performance can be viewed as the overall goal seeking behavior of management, usually displaying itself as growth and elaboration, or scarce resource acquisition. The situation as indicated previously, is the input aspect of the organization (both human and non-human resources). Performance, as a function of environmental factors, will limit or make available certain (often critical or scarce) resources to the organization. The planning and controlling functions of management also determine how performance criteria determine systems performance. Performance criteria relates to the output function of the organization. The management variable

interacts with the environment to determine required criteria for performing in a survival manner. This then sets the sub-goals which contribute to the overall systems performance.

Usefulness of the Theory For More Effective Management Practice

Our position is that open systems theory has resulted in very little if any usefulness to management practitioners. On the other hand, OST has been somewhat useful in making the practicing manager aware that the organization is composed of interacting subparts (technologies, resources, etc.) which contribute to the whole organizational performance. In addition OST makes the practitioner aware that there is an environment that supplies inputs and absorbs the organization's outputs. Furthermore, the environment places demands upon the organization (e.g. imposing new technologies, materials and standards upon the organization). The practitioner is made aware of these things--that he is no longer the "center of the universe".

However, other than increasing awareness of the complexities and perhaps making it easier to conceptualize the entire situation, OST has fallen short of providing the practitioner anything concrete for more effective performance. No variables are defined, only vague characteristics such as negative entropy, holism, and boundaries are offered. Admittedly, OST is intended to be applicable to all systems above Boulding's third level, i.e., any system that is self-maintaining such as a living organism. Nevertheless, the vagueness due to generalities does not lend itself to management techniques. This is why GCT is such a valuable contribution to operationalizing OST at the eighth level of social systems (human organizations). GCT provides clarity and specific guidelines for the practitioner in four major areas: (1) contingency guidelines for practicing managers; (2) explicit awareness of variables and relationships; (3) a definite statement of systems performance whether at the subunit

level; and finally, (4) GCT provides clarity and information concerning goals and objectives.

1. Contingency guidelines. OST emphasizes the dependence of the system upon its environment. Yet, the contingencies are not explicitly stated for the practice of management. The GCT matrix, however, provides a specific databased framework for analyzing and diagnosing situations and applying techniques that result in specified levels of performance. Given a particularly desired state of systems performance (P), the GCT matrix guides the manager in the appropriate actions to take regarding the situational and performance criteria variables.

2. Explicit awareness of variables. GCT increases the awareness and sensitivity of the manager to relevant variables. While OST only recognizes the environment, GCT indicates more explicitly what system's variables to consider and the relationships of the variables to each other. Again the GCT matrix becomes an invaluable tool to the practitioner in specifying the variables and relationships.

3. Systems performance. Although OST emphasizes systems performance outcomes, they are more precisely defined by GCT. The statements of interaction indicate the required inputs for different types of outcomes. Furthermore, GCT indicates how the variables interrelate together to produce desired organizational outcomes.

4. Goals and objectives. GCT adds clarity to assist in viewing what goes into m _ting goals and objectives. The GCT matrix provides actual information as inputs into the decision-making process for determining the specific goals and objectives-outcomes.

A comparison of OST and GCT against theory and practice can be summarized in the following figure:

	THEORY	PRACTICE
OST	Can't predict. Too general and vague. No precise concepts or relationships. Mere descriptions of functioning of the system.	Has little more to offer than mere description of processes. Enhances understanding of complex systems and functioning.
GCT	Precise conceptual variables along with relationships of variables. Propositional statements stated.	GCT matrix aids in applying conceptual variables within OST framework to the practice of management.

It is not our intention that GCT should replace OST. OST is far too comprehensive and widely recognized to throw out. We simply offer GCT as an alternative way to operationalize OST characteristics and concepts as applied to social systems. In particular GCT provides a framework for the categorization and structuring of research and practice for improved organizational effectiveness. The GCT matrix not only relates the variables of the system, but it also functionally predicts states of variables in the system.

This paper has proposed that GCT be considered an alternative to OST as the theoretical base for improved organizational performance. It was argued that OST is too vague and lacks precise concepts which result in little or no ability to predict or aid practicing management. After presenting a review of OST and GCT, GCT was advocated as a method of adding clarity to OST at the social systems level in Boulding's scheme.

GCT contains three primary variables which interact to form secondary variables which in turn yield overall systems performance. The value of GCT is in providing more precise conceptual variables and an integrative framework for relating the variables in order to provide functional predicitions. The GCT matrix is proposed as a valuable tool for assisting practicing management and eventually organizational effectiveness.

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